

# P3 Component Detection Using HHT Improvement of EMD with Additional Stopping Criteria



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This paper describes improvement of the Hilbert-Huang transform (HHT) for detection of ERP components in the EEG signal. Time-frequency domain methods, such as the wavelet transform or matching pursuit, are commonly for this task. We used a modified Hilbert-Huang transform that allows the processing of quasi-stationary signals such as EEG. The essential part of the HHT is an Empirical Mode Decomposition (EMD) that decomposes signal into intrinsic mode functions (IMFs). We designed additional stopping criteria for better selection of IMFs in the EMD. These IMFs positively affect later computed instantaneous attributes and increase classification success. We tested the influence of additional stopping criteria on classification reliability using the real EEG data acquired in our laboratory. Our results demonstrated that we were able to detect the P3 component by using the HHT with additional stopping criteria more successfully than by using the original implementation of modified HHT, continuous wavelet transform and matching pursuit.

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